WHAT IS CLAIMED IS:

1. A semiconductor device comprising a silicon substrate and an NMOSFET formed on the silicon substrate, the NMOSFET including n-type source/drain main regions containing arsenic as n-type impurities, and n-type source/drain buffer regions located below the source/drain main regions and in contact therewith, the source/drain buffer regions having arsenic and phosphorous as n-type impurities at a concentration lower than an impurity concentration in the source/drain main regions, the concentration of the phosphorous in the source/drain buffer regions being smaller than a concentration of the arsenic therein.

2. The semiconductor device as defined in claim 1, wherein the NMOSFET comprises a channel region between the source/drain main regions, and two n-type extension regions extending from the source/drain regions and opposing to each other across the channel region, and the source/drain buffer regions do not extend beyond the extension regions toward the channel region.

3. A method for manufacturing a semiconductor

device comprising the steps of:

implanting arsenic ions in a semiconductor substrate at a first acceleration energy level which suppresses a reverse channel effect to form arsenic ion implanted regions :

implanting phosphorous ions in the arsenic ion implanted regions, following the arsenic ion implanting step, at a second acceleration energy level lower than the first acceleration energy level, so as to form a concentration peak of the phosphorous ions located in the arsenic ion implanted regions;

heat-treating the ion-implanted regions for activation of the arsenic ions and the phosphorous ions to form source/drain regions; and

forming an NMOSFET having the source/drain

4. The method as defined in claim 3, wherein n-type impurities are implanted in the NMOSFET region to form an n-type extension region before the arsenic and phosphorous implanting step.

5. The method as defined in claim 3, wherein a dosage of the arsenic ion is determined to obtain electrical characteristics required for the NMOSFET, and an acceleration energy and a dosage of the phosphorous

ion are determined such that an ion-implanted region of the phosphorous ion extends beyond a bottom surface of an ion-implanted region of the arsenic ion.

6. The method as defined in claim 3, wherein the acceleration energy of the arsenic ion is not higher than 15 keV, and the acceleration energy of the phosphorous ion is not higher than 10 keV and is lower than that of the arsenic ion.

7. The method as defined in claim 3, wherein the dosage of the arsenic ion is between $2 \times 10^{15}/cm^2$ and $1 \times 10^{16}/cm^2$, and the dosage of the phosphorous ion is between $5 \times 10^{14}/cm^2$ and $2 \times 10^{15}/cm^2$.